

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-073253

(43)Date of publication of application : 19.03.1996

(51)Int.Cl.

C04B 28/10

B01J 20/18

C04B 14/04

C04B 24/26

C04B 41/65

(21)Application number : 06-211404

(71)Applicant : NATL HOUSE IND CO LTD  
NIPPON SEKKO BOARD KK  
ASIA KOGYO KK

(22)Date of filing : 05.09.1994

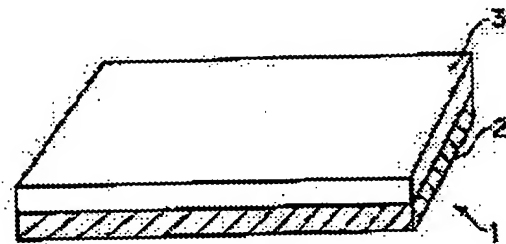
(72)Inventor : YASUDA TETSUO  
UCHIYAMA KENICHI  
TAMURA HIDEKI

## (54) MASTIC COMPOSITION FOR INORGANIC BOARD

### (57)Abstract:

PURPOSE: To improve hygroscopicity and moisture releasing property while keeping texture peculiar to a mastic in the mastic composition used for an inorganic board.

CONSTITUTION: The mastic composition for the inorganic board is obtained by mixing 100 pts.wt. mastic, 5-30 pts.wt. synthetic zeolite with 50-120 pts.wt. water to make a mastic slurry and drying. And the mastic board 1 is provided with an inorganic base material 2 and the mastic composition for the inorganic board laminated on the base material.



## LEGAL STATUS

[Date of request for examination]

30.11.2000

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the

examiner's decision of rejection or application  
converted registration]

[Date of final disposal for application]

[Patent number] 3349269

[Date of registration] 13.09.2002

[Number of appeal against examiner's decision of  
rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

Claim(s)]

[Claim 1] The mortar constituent for minerals boards obtained by carrying out desiccation processing after mixing the mortar 100 weight section, permutite 5 - 30 weight sections, and water 50 - the 120 weight sections and considering as a mortar slurry.

[Claim 2] The mortar constituent for minerals boards according to claim 1 with which said mortar slurry contains further the kneading agent 5 - 20 weight sections to said mortar 100 weight section.

[Claim 3] The mortar constituent for minerals boards according to claim 1 or 2 said whose permutite is a permutite A mold.

[Claim 4] The mortar constituent for minerals boards according to claim 2 or 3 with which said kneading agent contains drainage system acrylic resin.

[Claim 5] The mortar board equipped with the mortar constituent for minerals boards according to claim 1 to 4 by which the laminating was carried out to inorganic substrate material and said inorganic substrate material.

**This Page Blank (uspto)**

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the mortar board which used the mortar constituent for minerals boards, and this.

[0002]

[Description of the Prior Art] Before, in the humid house in Japan, timber is used as an ingredient which has a gas conditioning function, and this is equipped with an indoor humidity control function and an indoor dew condensation prevention function. However, timber has the problem that the dimensional stability as an ingredient and refractoriness are missing. In the reinforced-concrete-construction building in recent years etc., using timber for interior materials is restricted by the Building Standard Law. Moreover, the humidity control function of timber cannot fully be demonstrated over a long period of time.

[0003] Japan where mortar is seen by a private house, the godown, etc. — it is a traditional structural ingredient from ancient times, and it solves automatically and has the crowded beauty which was fallen and attached. However, mortar cannot prevent generating of dew condensation, even if a gas conditioning function is low and uses mortar as interior materials compared with timber.

[0004]

[Problem(s) to be Solved by the Invention] The technical problem which is going to solve this invention is raising hygroscopicity and moisture desorption characteristics in the mortar constituent used for a minerals board, holding texture peculiar to mortar.

[0005]

[Means for Solving the Problem] After mixing the mortar 100 weight section, permutite 5 - 30 weight sections, and water 50 - the 120 weight sections and considering as a mortar slurry, the mortar constituent for minerals boards of this invention carries out desiccation processing, and is obtained. When said mortar slurry contains further the kneading agent 5 - 20 weight sections to said mortar 100 weight section, it is desirable.

[0006] Said permutite is desirable in it being a permutite A mold. It is desirable when said kneading agent contains drainage system acrylic resin. Moreover, the mortar board of this invention is equipped with the above-mentioned mortar constituent for minerals boards by which the laminating was carried out to inorganic substrate material and said inorganic substrate material.

\* Explain this invention below to \*\*\*\*\* in detail.

[0007] If the mortar used for this invention contains slaked lime, there will be especially no definition. mortar — except for slaked lime — suitably — an inorganic material — \*\* — the paste for mortars may be contained. As an inorganic material, a calcium carbonate, a barium carbonate, and a barium hydroxide can be mentioned, for example. Since it mixes with an inorganic material with slaked lime and it raises reinforcement, its calcium carbonate is desirable. The loadings of an inorganic material have the desirable range of 5 - 30 weight section to the slaked-lime 100 weight section.

[0008] \*\*\*\*\* has the work which prevents a crack, when a mortar constituent is used for a wallplate etc., for example, it can mention Manila hemp, Japanese paper, \*\*\*\*\*, wood pulp, a synthetic fiber, and a glass fiber. Without spoiling the texture of mortar, fiber of \*\*\*\*\* is thin and what has high reinforcement is good. from such a viewpoint — \*\* — \*\* — Japanese paper is desirable if it carries out. The loadings of \*\*\*\*\* have the desirable range of 0.5 - 2 weight section to the slaked-lime 100 weight section.

[0009] the paste for mortars — from ancient times — since — you may be any of a natural paste and a synthetic paste which are used, and these may be used, mixing suitably. As a paste for mortars, synthetic pastes, such as natural paste; polyvinyl alcohol, such as glue, regular rice, konnyaku powder, and a cloth dried seaweed, methyl cellulose, hydroxyethyl cellulose, and hydroxypropylcellulose, can be mentioned, for example. The loadings of the paste for mortars have the desirable range of the 0.5 - 1.5 weight section to the slaked-lime 100 weight section.

[0010] If the permutite used for this invention is a zeolite compounded artificially, there will be especially no definition. As an example of the concrete goods of the permutite used for this invention, "Siluton B", "Siluton CP", "Siluton CPT", "MIZUKA sieves" (above, Mizusawa Industrial Chemicals, Ltd. make), and "industrial use zeolite SP#2300" (Japanese east powdering product made from Business affairs) are mentioned, for example. At least one kind of thing chosen from the group which consists of A mold, an X type, a Y mold, and a T mold may be used for permutite. In order to raise hygroscopicity and moisture desorption characteristics further, as permutite, A type composition zeolite is desirable and A type composition zeolite manufactured from the acid clay (montmorillonite) is good.

[0011] The loadings of permutite in the mortar slurry used as the raw material of the mortar constituent for minerals boards of this invention are 5 - 30 weight section to the mortar 100 weight section. The improvement in hygroscopicity and moisture desorption characteristics is inadequate in the loadings of permutite being under 5 weight sections. On the other hand, if 30 weight sections are exceeded, it will become light texture by porous one and profound texture peculiar to mortar will be lost.

[0012] Said mortar slurry contains water. The loadings of water are the 50 - 120 weight section to the mortar 100 weight section. A mortar slurry becomes it hard that the loadings of water are under 50 weight sections, and it is hard to deal with it, and it becomes difficult to finish the mortar constituent for minerals boards flat and smooth, and it becomes the cause which a big and rough bubble generates in the mortar constituent for minerals boards. On the other hand, if the 120 weight sections are exceeded, contraction when carrying out desiccation processing of the mortar slurry will be large, a crack will arise on the front face of the mortar constituent for minerals boards, and a front face will become weak.

[0013] As for said mortar slurry, the kneading agent, the pigment, the water reducing agent, the defoaming agent, etc. may be blended suitably. Said kneading agent contains resin and water. As resin contained in a kneading agent, drainage system acrylic resin, drainage system vinyl acetate system resin, drainage system epoxy system resin, and drainage system urethane system resin are mentioned, for example. The resin in a kneading agent and the compounding ratio of water are 50 - 70 % of the weight of water to 30 - 50 % of the weight of resin. Components other than resin and water may be blended into the kneading agent if needed.

[0014] If the mortar slurry contains further the kneading agent 5 - 20 weight sections to the mortar 100 weight section, when the laminating of the mortar constituent for minerals boards of this invention is carried out to a minerals ingredient, the bond strength of a minerals ingredient and a mortar constituent can be raised, and the impact strength of a mortar finishing layer will become high. The bond strength of a minerals ingredient and a mortar constituent can be further raised as the resin contained in a kneading agent is drainage system acrylic resin, and the impact strength of a mortar finishing layer becomes still higher.

[0015] As said pigment, ferrous oxide, cyanine Green, titanium oxide, and carbon are mentioned, for example. As for the loadings of a pigment, it is desirable that it is 0 - 3 weight section to the mortar 100 weight section. As said water reducing agent, the thing containing phenol system powder, naphthalene system powder, and lignin system powder is mentioned, for example. As for the loadings of a water reducing agent, it is desirable that it is the 0.3 - 1.0 weight section to the mortar 100 weight section.

[0016] As said defoaming agent, NOPUKO 8034, NOPUKO NXZ, the former star PC, SN DIHOMA 113, and DEHIDORAN C are mentioned, for example. As for the loadings of a defoaming agent, it is desirable that it is the 0.1 - 1.0 weight section to the mortar 100 weight section. In the approach of manufacturing the mortar constituent for minerals boards of this invention, a mortar slurry is manufactured first. A mortar slurry can be manufactured by mixing stirring each component explained by the above which constitutes the mortar constituent for minerals boards in order of arbitration. After making water distribute a kneading agent especially, when it manufactures by the approach of mixing while adding mortar and fully stirring, viscosity is low, and since it excels in leveling nature, it is desirable. Next, the mortar constituent for minerals boards is manufactured by carrying out desiccation processing of the mortar slurry. Although there is especially no definition about the conditions which carry out desiccation processing of the mortar slurry, it is 120-180 degrees C in drying temperature, and holding for 1 to 2 hours is desirable.

[0017] The mortar board of this invention is equipped with the above-mentioned mortar constituent for minerals boards by which the laminating was carried out to inorganic substrate material and said inorganic substrate material. An example of the mortar board of this invention is shown in drawing 1 and drawing 2. The mortar board 1 is equipped with the mortar constituent 3 for minerals boards by which the laminating was carried out to the inorganic substrate material 2 and inorganic substrate material in drawing 1 and drawing 2. polishing is applied and glossy [ the front face of the mortar constituent 3 for minerals boards ] in drawing 1, - common finishing is carried out. Moreover, in drawing 2, as for the front face of the mortar constituent 3 for minerals boards, the brick pattern is attached with the mold.

[0018] As inorganic substrate material, if it is an inorganic raw material, there will be especially no definition, for example, concrete, brick, mortar, a soil wall, a calcium silicate plate, a slate plate, plaster board, etc. will be mentioned. The thickness of arbitration and the thing of magnitude are used about the configuration of inorganic substrate material. About the laminating approach of the mortar constituent for minerals boards of this invention, there is especially no definition and it can be performed by the usual laminating approaches, such as an imprint, spraying, and casting. Moreover, before carrying out the laminating of the mortar

constituent to substrate material, when undercoat is beforehand carried out to substrate material with the sealer, since the bond strength between substrate material and a mortar constituent improves, it is desirable. It is still more desirable when compression molding is performed, in order to raise the bond strength of an after [ a laminating ] mortar constituent, and substrate material.

[0019] As the front face of the mortar constituent for minerals boards was shown in drawing 1, after making it common, polishing was applied, and as common finishing may be carried out and it is shown in drawing 2, before [ glossy ] drying a front face, the pattern of arbitration could be given with the mold. Hygroscopicity and its moisture desorption characteristics are high, the obtained mortar board holding texture peculiar to mortar, since the laminating of the mortar constituent for minerals boards is carried out. Thus, since hygroscopicity and its moisture desorption characteristics are improving the obtained mortar board holding texture peculiar to mortar, it can be used as interior materials and can prevent generating of indoor dew condensation.

[0020]

[Example] The following example is instantiation of this invention and does not restrict the claim of this invention. In addition, "%" in an example means "% of the weight." The assessment approach in an example and the example of a comparison is as follows.

The tubed flow cone with a diameter of 90mm specified to assessment approach (activity sex test) JIS-A -1109 was placed on the glass plate. The slurry which was made to scour the component of a constituent mutually for 10 minutes, and was obtained was slushed from the flow cone, the flow cone was drawn out immediately, and the slurry was extended to the glass plate. When the motion of a slurry stopped, the diameter of the slurry which spread in the shape of a circle was measured.

[0021]

O : -- the breadth of a slurry -- 150-200mm\*\* : -- the breadth of a slurry -- 90-150mmx : -- the specimen in which the breadth of a slurry carried out 90mm or less (hygroscopicity and moisture-desorption-characteristics trial) solidification -- constant temperature -- it put into the constant humidity chamber A (25 degrees C, 40% RH), and it was left until it became constant weight (for about seven days). the event of becoming constant weight -- an initial mass -- carrying out -- a degree -- a specimen -- constant temperature -- it put into the constant humidity chamber B (25 degrees C, 80%RH), aging of the weight of 1, 2, 3, 4, 6, 9, 24, 48, and 72 hours after was measured, and the amount of moisture absorption was calculated by the bottom formula. furthermore, constant temperature -- it was left until it became constant humidity chamber B constant weight (for about seven days). the event of becoming constant weight -- new -- an initial mass -- carrying out -- a degree -- a specimen -- constant temperature -- it put into the constant humidity chamber A (25 degrees C, 40% RH), aging of the weight of 1, 2, 3, 4, 6, 9, 24, 48, and 72 hours after was measured, and moisture desorption volume was calculated by the bottom formula.

[0022]

$$\text{吸湿量(g/m}^2\text{)} = \frac{\text{経過時間後重量} - \text{初期重量}}{\text{試験体表面積}}$$
$$\text{放湿量(g/m}^2\text{)} = \frac{\text{初期重量} - \text{経過時間後重量}}{\text{試験体表面積}}$$

O : the specimen (400x400mm) solidified on the two or less (\*\*\*\* impact test) 380-500g/[m ]2\*\*:250-380g [m ]2x:250 g/m sandbox was carried. The shot with a weight of 1kg was dropped from the place 0.5m right above the core of a specimen.

[0023] O : with no abnormalities.

\*\* : Two or less cracks with a width of face [ 0.1 ] - a die length of 10mm occurred.

x : The crack occurred in the whole specimen.

(Hair-cracking trial at the time of desiccation) The mortar constituent was slushed so that it might become 10mm in installation and thickness about a wooden flask around plaster board (200mmx200mmx9mm), and the front face was rubbed 3 to 4 times. It put into the 120-degree C oven for 2 hours, and the generating situation of hair cracking was observed.

[0024] O : with no abnormalities.

\*\* : One or less hair cracking with a width of face [ 0.05 ] - a die length of 5mm occurred.

x : Hair cracking occurred in the whole specimen.

(Examples 1-3 and examples 1-2 of a comparison) The component shown in a table 1 was prepared about examples 1-3 and the examples 1-2 of a comparison (a numeric value shows the weight section.). The components of the used mortar were 69% of slaked lime, 29% of calcium carbonates, 0.8% of pastes, and 1.2% of Japanese paper. After putting the kneading agent into water and stirring, mortar, permutite, the pigment, and the water reducing agent were added, it stirred by the hand mixer, and the mortar slurry was obtained. The activity sex test was performed about the obtained slurry. The rubber system shaping sheet (200mm[ 200mm by ] x thickness of 10mm) was set to shuttering, and the slurry was slushed into the rubber system shaping sheet surface, and it applied to homogeneity and extended. After applying a drainage system sealer to plaster board (210mm[ 210mm by ] x thickness of 9mm), the laminating of the slurry was carried out to plaster board. It pressed for 2 - 3 minutes, having put the pressure of 20-30kg/cm2 on the obtained layered product, it put into the 120-degree C drier for 2 hours, and the mortar board was obtained. The hair-cracking trial was performed at the time of desiccation. About the obtained mortar board, hygroscopicity, the moisture-desorption-characteristics trial, and the \*\*\*\* impact test were performed.

[0025]

[A table 1]

		実施例 1	実施例 2	実施例 3	比較例 1	比較例 2
組成	漆 喰 * 1	100	100	100	100	100
	合成ゼオライト * 2	5	10	20	0	10
	混練剤 * 3	10	10	10	0	10
	顔料 * 4	1	1	1	1	1
	減水剤 * 5	0.5	0.5	0.5	0.5	0.5
	水	80	80	80	80	45
評価項目	作業性	○	○	△	○	×
	吸湿性・放湿性	△	○	○	×	○
	落重衝撃性	○	○	○	×	○
	乾燥時ヘアクラック性	○	○	○	△	○
	総合評価	△	○	△	×	×

- \* 1 高級しろかべ、田川産業 (株) 製
- \* 2 シルトンB、水澤化学工業 (株) 製
- \* 3 ポリパー 49、亜細亜工業 (株) 製
- \* 4 EMカラー、亜細亜工業 (株) 製
- \* 5 ビルバーズ、日本製紙 (株) 製

[0026] (An example 4 and examples 3-7 of a comparison) The permutite X type was used for the example 4 instead of the permutite A mold in the example 2. Natural zeolite, the synthetic sepiolite A, and the synthetic sepiolite B were used for the examples 3-5 of a comparison instead of the permutite A mold in the example 2, respectively. Moreover, the example 6 of a comparison prepared only plaster board, the example 7 of a comparison prepared only the cedar plate, and the laminating of the mortar constituent was not carried out. About each, workability, the amount of moisture absorption and moisture desorption volume (3, 25, and 160 hours after), and the hair-cracking nature at the time of desiccation were measured.

[0027] The mortar board which carried out the laminating of the mortar constituent containing a permutite A mold excels the cedar plate in about 3 time moisture absorption and moisture desorption performance after 25 hours. However, in natural zeolite and sepiolite, such effectiveness was small.

[0028]

[A table 2]



	3時間後		25時間後		160時間後		作業性	乾燥時ヘアー クラック性	総合 評価	備 考
	吸湿量	放湿量	吸湿量	放湿量	吸湿量	放湿量				
実施例2	100	130	280	290	460	320	○	○	◎	合成ゼオライトA型
実施例4	90	93	222	165	322	330	○	○	○	合成ゼオライトX型
比較例3	58	50	100	60	100	30	○	○	×	天然ゼオライト
比較例4	60	75	100	120	130	120	△	○	△	合成セピオライトA
比較例5	50	52	70	80	100	80	×	○	△	合成セピオライトB
比較例6	20	20	30	30	30	30	—	—	×	石膏ボード 厚さ9mm
比較例7	40	25	120	100	280	170	—	—	△	杉板 厚さ12mm

上記の吸湿量・放湿量の単位は、g/m<sup>2</sup>である。

天然ゼオライトは、SP#2300（日東粉化商事（株）製）である。

合成ゼオライトAは、エードプラスSP（水澤化学工業（株）製）である。

合成ゼオライトBは、エードプラスML-500（水澤化学工業（株）製）である。

石膏ボードは、アドラセッコウボード（日本石膏ボード（株）製）である。

[0029]

[Effect of the Invention] It can raise hygroscopicity and moisture desorption characteristics, holding texture peculiar to mortar, since the mortar constituent for minerals boards of this invention carries out desiccation processing and is obtained, after it mixes the mortar 100 weight section, permutite 5 - 30 weight sections, and water 50 - the 120 weight sections and makes them a mortar slurry.

[0030] If the mortar constituent for minerals boards contains further the kneading agent 5 - 20 weight sections to said mortar 100 weight section, when a laminating is carried out to a minerals ingredient, the bond strength of a minerals ingredient and a mortar constituent can be raised, and the impact strength of a mortar finishing layer will become high. Hygroscopicity and moisture desorption characteristics can be further raised as said permutite is a permutite A mold.

[0031] If said kneading agent contains drainage system acrylic resin, the concordance of a minerals ingredient and a mortar constituent becomes good, bond strength can be raised further and the impact strength of a mortar finishing layer will become still higher. Holding texture peculiar to mortar, hygroscopicity and moisture desorption characteristics of the mortar board of this invention are improving, and if it is used as interior materials, it can prevent generating of dew condensation.

**This Page Blank (uspto)**